

LITHOLOGIC LOG

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LOCATION MAP:

BLM-1-435

BLM-2-482 •

BLM-7-509 •

BLM-10-517 •

NORTH

SITE ID: NASA

LOCATION ID: BLM-1-435.3

SITE COORDINATES (ft.):

N 229564.66

E 403726.68

GROUND ELEVATION (ft. MSL): 4551.67 (BRASS CAP)

STATE: NEW MEXICO

COUNTY: DOÑA ANA

DRILLING METHOD: AIR-FOAM ROTARY

DRILLING CONTR.: LARJON

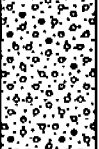








DATE STARTED: 23 September 1987 DATE COMPLETED: 13 November 1987

FIELD REP.: E. MORSE

COMMENTS: Top Bedrock @ 457'. Total Depth = 500'.

LOCATION DESCRIPTION:

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
			begin time		0'-5' No sample available.
5			5		5'-25' <u>SURFICIAL SAND AND SOIL</u> Fine-grained sand to pebbles with silt and clay. Color is pale yellowish brown (10YR 5/4). Cuttings are angular to rounded and consist of limestone, siltstone, granite, dolomite, quartzite and volcanics. Samples are unconsolidated and very sandy. Some organic material present.
10	+++++SVV		6.5	10'-469' cuttings	15'-20' Increased clay soil content.
15	+++++SV		5		
20	+++++SV		5		
25	+++++VOC		9.5		25'-457' <u>GRAVELLY ALLUVIUM (Santa Fe Group)</u> Poorly to moderately consolidated, fine-grained sand to pebble-size cuttings of angular to subrounded clasts of limestone, dolomite, volcanics, granite, siltstone, quartzite, caliche and quartz. Color is light gray but individual grains range from white (N9) to black (N1) to dusky red (5R 3/4).
30	+++++VOC		10		30'-40' Abundant caliche and caliche-coated grains.
35	+++++VOC		9		
40	+++++VOC		4.5		40'-50' Significant increase in cutting size; cuttings up to 1 inch.
45	+++++VOC		~ 2		
50	+++++VOC		~ 2		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
					GRAVELLY ALLUVIUM (Santa Fe Group) Continued
50	+++++//		~ 2		50'-60' Cutting size decreases to clay and sand with large caving material. Appears to be another soil horizon.
55	+++++vv//		~ 2		
60	++++=====v		~ 2		60'-65' Large cuttings mixed with silty clay material.
65	+++++=====v		~ 2		65'-75' Large cuttings predominate with the clay-silts content decreasing.
70	+++++=====v		~ 2		
75	+++++=====v		~ 2		75'-80' Increased clay content.
80	+++++=====v		~ 2		80'-85' Large decrease in clays, cutting size average 0.2 inches in diameter.
85	+++++//vv=		~ 2		85'-90' Very large cuttings less abundant. Cuttings are typically angular, but rounded and sub-rounded shapes are present.
90	+++++//vv=		~ 2		90'-100' Average size of cuttings is 0.4 inches, no indication of improved consolidation. Alluvium is weakly cemented. Rhyolite clasts and clay abundant.
95	+++++//vv=		~ 2		
100	+++++//vv=		~ 2		100'-115' Little clay in alluvial sample
105	+++++vvvv//		~ 2		
110	+++++vvvv//		~ 2		
115	+++++vvvv//		~ 2		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
					<u>GRAVELLY ALLUVIUM (Santa Fe Group) Continued</u>
115	+++++VVV//o		~ 2	115'-120'	Increase in clay-silt content.
120	+++++===VV		~ 2	120'-125'	Possible thick soil horizon.
125	+++++===V		~ 2	125'-130'	Sample rich in clay and silt.
130	+++++===VV		~ 2	130'-135'	High clay content with <0.1 inch size cuttings of predominantly limestone.
135	+++++===V		~ 2	135'-145'	Abundant clay, samples ball up when placed in screen.
140	+++++===V		~ 2		
145	+++++===VV		~ 2	145'-160'	Less clay, limestone are dominant clasts.
150	+++++===VV		~ 2		
155	+++++===VV		~ 2		
160	+++++===VV//		~ 2	160'-170'	Abundant clay.
165	+++++===VV		~ 2		
170	+++++===V		~ 2	170'-180'	Large decrease in clay content, cuttings are medium-grained sand to pebble-size, angular, and are composed of limestone, rhyolite, siltstone and quartz. No caliche present.
175	+++++===V//		~ 2		
180	+++++VVV//		~ 2		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
					<u>GRAVELLY ALLUVIUM (Santa Fe Group)</u> Continued
180	+++++VVVV		~ 2		180'-185' Cutting size is increasing with clasts up to 0.75 inches long, clay content is decreasing. Granite and andesite found in low percentages.
185	+++++VVVV		~ 2		
190	+++++VVVV		~ 2		
195	+++++VVVV		~ 2		
200	+++++VVVV		~ 2		
205	+++++VVVV		~ 3		
210	+++++VVVV		~ 4		210'-215' Noticeable decrease in clay content. Cuttings do not stick together as readily. Cutting size average at 0.4 inches. Cuttings consist of black to light gray limestone and dolomites, white to cream rhyolites, maroon siltstones and andesite with trace amounts of quartz, granite and calcite. Little or no clay present.
215	+++++VVVV		~ 2		
220	+++++VVVV		~ 5		215'-220' Cuttings range in size from 0.05 to 0.5 inches.
225	+++++VVVV		~ 5		225'-230' Rhyolite and limestone make up most of the alluvium lithology.
230	+++++VVVV		~ 11		230'-235' Some caliche coated grains and an average decrease in cutting size is noted to <0.1 inches.
235	+++++VVVV		?		
240	+++++VVVV		?		240'-245' Some large clasts up to 1 inch present; size range is from <0.1 to 1.0 inches with average at 0.1 inches.
245	+++++VVVV		?		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
					<u>GRAVELLY ALLUVIUM (Santa Fe Group) Continued</u>
245	++++VVVV//		?		245'-250' Yellow oxidized rhyolite is common. Some caliche is present, no clays.
250	++++VVVV//		?		250'-255' Cutting size decreasing dramatically with the average now <0.1 inches. May indicate better consolidation of the alluvium. More white calcite observed; could be carbonate pore or fracture fill.
255	++++VVVV//		7.5		255'-260' Cuttings becoming medium-grained sand size and more uniform overall. The rock is probably getting more consolidated. No clays.
260	++++VVVV//		8		
265	++++VVVV//		7		265'-270' Granite cuttings present in small amounts
270	++++VVVV//		8		270'-275' Average cutting size is <0.1 inches; medium-grained sand size overall.
275	++++VVVV//		6.5		275'-280' Cutting size increase to 1.0 to 2.0 inches average. Alluvium is still the same compositionally. Little clays.
280	++++VVVV//		7		
285	++++VVVV//		11		285'-290' Cuttings up to 0.5 inches in size. No change in lithology.
290	++++VVVV//		12		290'-295' A slight increase in fine-grained sand and clay content. Cutting size is <0.1 inches.
295	++++VVVV//		12		295'-300' Cutting size is medium- to coarse-grained sand. No change in lithology.
300	++++VVVV//		5.5		
305	++++VVVV//		12.5		
310	++++VVVV//		12		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
					<u>GRAVELLY ALLUVIUM (Santa Fe Group) Continued</u>
310	+++++VVV		12	310'-315'	An increase in fine-grained sand and clay is noticed. Cuttings are somewhat larger with pieces up to 0.3 inches in size.
315	+++++VVV		11.5	315'-320'	Cuttings are medium- to coarse-grained sand size and finer-grained overall than 315'-320' sample. Oxidized rhyolite is abundant along with black to gray limestone. Same silt/clay content present.
320	+++++VVV		11.5	320'-325'	Medium- to coarse-grained sand size cuttings with some silty/clay matrix material. Consolidation appears to vary in the hole as does clay content. The lithology is relatively constant; the cutting size and clay percent is what varies.
325	+++++VVV		11	325'-330'	Slightly less clay, calcite and quartz present in minor amounts.
330	+++++VVV		16	330'-335'	Cutting size has increased to an average of <0.1 inches. Some green andesite and white calcite observed. Lesser amounts of clay.
335	+++++VVV		8	335'-340'	Average clast size is <0.1 inches. No significant lithology change. No clear evidence of carbonate cementation. Lithology is probably weakly-to-moderately consolidated with clays, silt and fine-grained sand.
340	+++++VVV		4	340'-345'	Alluvium consists mostly of limestone and volcanic cuttings with lesser amounts of siltstone, dolomite, quartz, calcite, granite and sandstone. Volcanics are mostly rhyolite with some andesite.
345	+++++VVV		4	345'-350'	Cutting size average approximately 0.1 inches; clasts up to 0.5 inches.
350	+++++VVV		4	350'-355'	Dark gray, light gray-to-black carbonates dominate cuttings.
355	+++++VVV		4	355'-360'	Fine-grained sand and silts and clays appear to make up the matrix material between grains. The overall alluvial section is finer-grained with smaller clasts. No boulders and much more silt and clays.
360	+++++VVV		4	360'-365'	Some cuttings up to 0.75 inches. Caliche observed.
365	+++++VVV		4	365'-370'	Both rhyolite and andesite present. Trace amounts of quartz, granite and calcite. * Note: Cuttings are not coming out the hole continuously. Drill 20', then let pressure push all cuttings out at once; may cause lithology accuracy problem.
370	+++++VVV		4	370'-375'	An apparent increase in clay content. Samples are coated with a tan colored mud. A slight decrease in cutting size is noticed.
375	+++++VVV		4		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
					<u>GRAVELLY ALLUVIUM (Santa Fe Group) Continued</u>
375	++++VV==		4	375'-380'	Sample is very muddy, more clay and silt present, however, this traps more drilling foam. Makes determination of lithology difficult. Cuttings are an average of <0.1 inches in size.
380	++++VVVV=		4		
385	+++++VVVV=		4	385'-390'	Mud foam mixture still present. A slight increase in cutting size to <0.1 inches average. Some up to 0.75 inches.
390	+++++VVVV=		4		
395	+++++VVVV=		4	395'-400'	More andesite volcanic cuttings are present, both green and maroon colors.
400	+++++VVVV=		4	400'-405'	A significant increase in volcanic (mainly andesite) is observed. Limestone is much less abundant.
405	+++++VVVV=		4	405'-410'	Abundant maroon volcanics and granitic fragments.
410	+++++VVVV=		4	410'-415'	Noted change in drilling. Drill bit quit jumping around and smoothed out. The cuttings are a fine- to medium-grained, subangular to sub rounded sand. It is weakly indurated and looks like a nice channel sand. Individual grains consist of quartz, volcanics, limestone and silt stone. Color is pale yellowish brown (10YR 6/2).
415			5		
420	+++++VVVV=		5	415'-420'	Cutting size has increased to coarse-grained sand to pebble size but is still more uniform than gravelly alluvium noted above in 415' sample. Volcanic rocks make up a large percentage of the cuttings. This sample could be evidence of erosional unroofing of the volcanics during Santa Fe Group depositional times.
425	+++++VVVV=		7		
430	+++++VVVV=		7	425'-430'	Alluvium continued.
				430'-435'	Volcanic clasts are <0.1 inches, angular, maroon to purple andesite, green andesite, cream to yellow (oxidized) rhyolite.
435	+++++VVVV=		7	435'-440'	Volcanic rich alluvium.
440	+++++VVVV=		7		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
					<u>GRAVELLY ALLUVIUM (Santa Fe Group)</u> Continued
440	+VVVVVVVVVVVV		7		
445	+VVVVVVVVVVVV		~ 5		
450	+VVVVVVVVVVVV		~ 6		
455	+VVVVVVVVVVVV		~ 7		
460	+VVVVVVVVVVVV		~ 32		457'-500' OREJON ANDESITE Brownish gray (5YR 4/1) to light gray (N7) porphyritic andesite. Fine- to coarse-grained (sand size), anhedral- to-euhedral phenocrysts of plagioclase and lesser amounts of mafic materials. The ground mass is holocrystalline and very fine-grained minerals. Calcite fracture fragments are common.
465	+VVVVVVVVVVVV		~ 27		455'-460' Cuttings increase in size to a 0.1 inch average. Cuttings are andesite (maroon and green) and yellow rhyolite.
470	VVVVVVVVVVVVV		~ 20	469'-479' core	460'-465' Cuttings are fine- to medium-grain sand size of volcanic rock fragments. Color is dark yellowish brown (10YR 4/2). * Cutting size is due to slow drilling which pulverizes the rock. Drillers log slowed down considerably.
475	VVVVVVVVVVVVV		-		469-479' ***** core interval ***** See attached description.
480	VVVVVVVVVVVVV		-	479'-500' cuttings	465'-470' Very fine texture continued. Lithology difficult to determine.
485	VVVVVVVVVVVVV		~ 24		480'-485' Andesite cuttings, fine- to medium-grained sand size dry fragments colored brownish gray (5YR 4/1). Black (N1), anhedral- to-euhedral mafic minerals and white (N9) anhedral- to-euhedral calcite cuttings are also present.
490	VVVVVVVVVVVVV		~ 25		
495	VVVVVVVVVVVVV		~ 18		
500	VVVVVVVVVVVVV		~ 22		Total Depth = 500'.
505					